

ICA Demonstration Project A

Project Plan Review

June 9, 2016

ICA Demo A Plan Summary

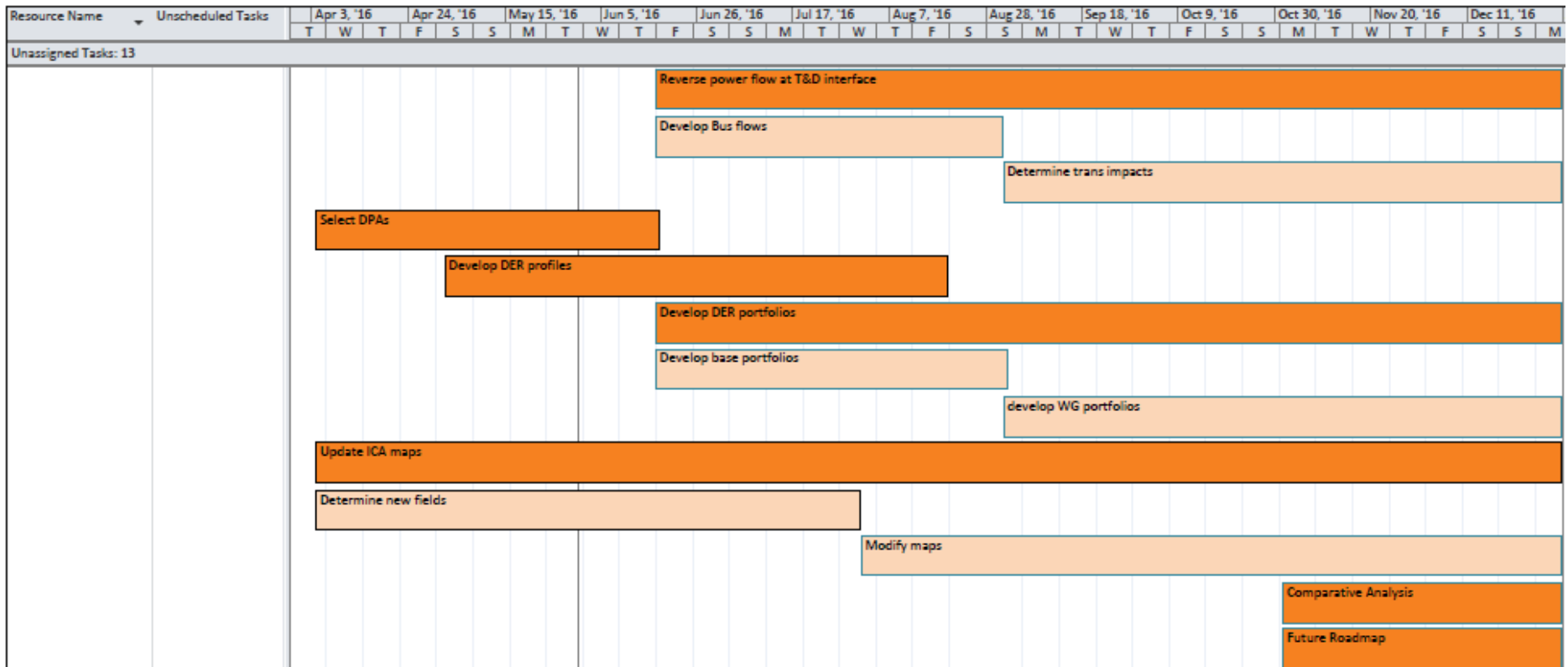
- Review Demo A objectives
- Review schedule
- Select distribution planning area (DPA) to use
- Perform ICA analysis using both iterative power flow and streamlined methods
- Update ICA Maps and results
- Perform comparative analysis to determine best ICA approach

Demo A Objectives

- Study reverse flow at T&D interface
 - DER Capacity with and without limiting reverse power beyond substation busbar
- Diverse Locations
 - Evaluate two DPAs (one urban and one rural) covering broad range of electrical characteristics
- Incorporate Portfolios and New Technology
 - Methods for evaluating DER portfolios, CAISO dispatch, and Smart Inverters
- Consistent Maps and Outputs
 - Consistent and readable maps to the public with similar data and visual aspects
- Computational Efficiency
 - Evaluate methods for faster and more accurate update process that works for entire service territory
- Comparative Analysis
 - Benchmark for consistency and validation across techniques and IOUs
- Locational Load Shapes
 - Utilize Smart Meters for localized load shapes
- Future Roadmap
 - Determine roadmap and timelines for future ICA achievements based on demonstration learnings



Schedule



Selecting DPA

- Optimal DPA to test ICA includes
 - Mixture of circuit characteristics
 - Mixture of customer types
 - Opportunities for DER
- SDG&E will implement the ICA starting with its Northeastern and North Coast Districts
 - Both urban and rural circuits
 - Mix of commercial, industrial, and residential
 - Large amount of land and customers ripe for DER development



A  Sempra Energy utility®

Northeast DPA



Customers	231,00
Residential	201,000
Commercial	30,000
Industrial	129
Total Load	1000 MW
Circuits	178
Substations	40
Transformers	47,275



ICA Criteria

Set exception limits

	En	Exception loading limits		Limits reserve amps	
		Continuous	Emergency	Cont	Emer
Lines:	<input checked="" type="checkbox"/>	100.0 % Cont	100.0 % Emer	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Switches:	<input checked="" type="checkbox"/>	100.0 % Cont	110.0 % Emer	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Meters:	<input checked="" type="checkbox"/>	100.0 % Cont	110.0 % Emer	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Regulators:	<input checked="" type="checkbox"/>	100.0 % Rated	110.0 % Emer	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Transformers:	<input checked="" type="checkbox"/>	100.0 % Cont	110.0 % Emer	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Feeders / subs:	<input checked="" type="checkbox"/>	100.0 % Rated	110.0 % Emer	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Fuses:	<input checked="" type="checkbox"/>	100 % Rated	100.0 % Rated	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Reclosers:	<input checked="" type="checkbox"/>	100.0 % Rated	110.0 % Rated	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Breakers:	<input checked="" type="checkbox"/>	100.0 % Rated	110.0 % Rated	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Sectionalizers:	<input checked="" type="checkbox"/>	120.0 % Rated	150.0 % Rated	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Voltage exceptions

High volt warn:	126.1 (120V)
CVR high warn:	123.5 (120V)
Low volt emer:	116.0 (120V)
Imbalance warn:	3.0 %

Limits for breakers and reclosers

<input checked="" type="radio"/> Breaker rating	<input type="radio"/> Breaker relay pickup
<input checked="" type="radio"/> Recloser rating	<input type="radio"/> Recloser relay pickup

Reverse flow

Max Fdr/Sub Rev Flow	100.0 %
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• ICA methodology checks for:

– Thermal limits

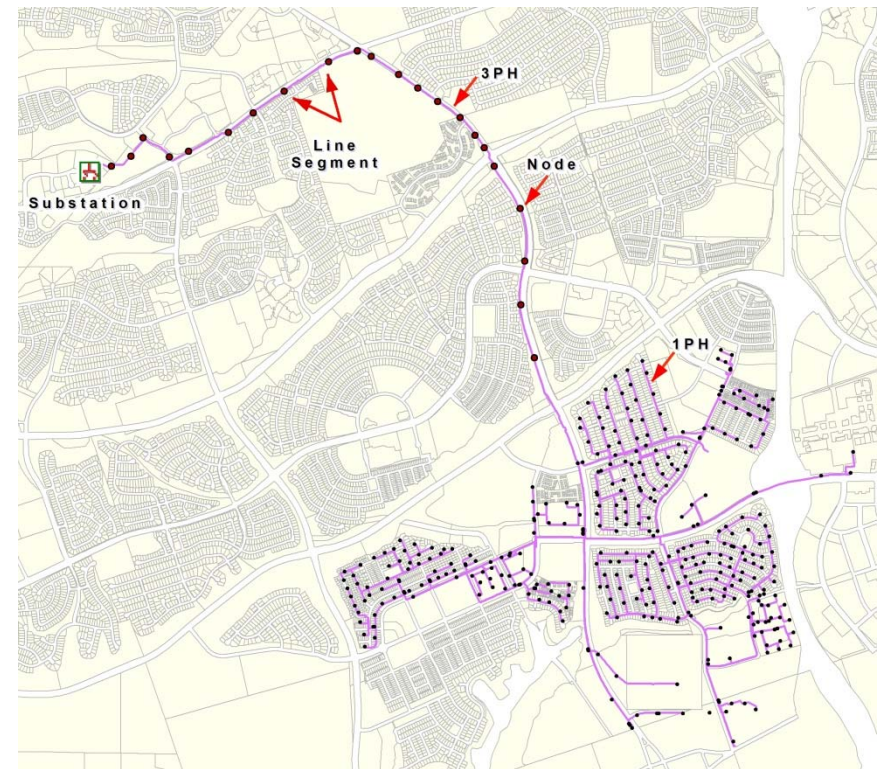
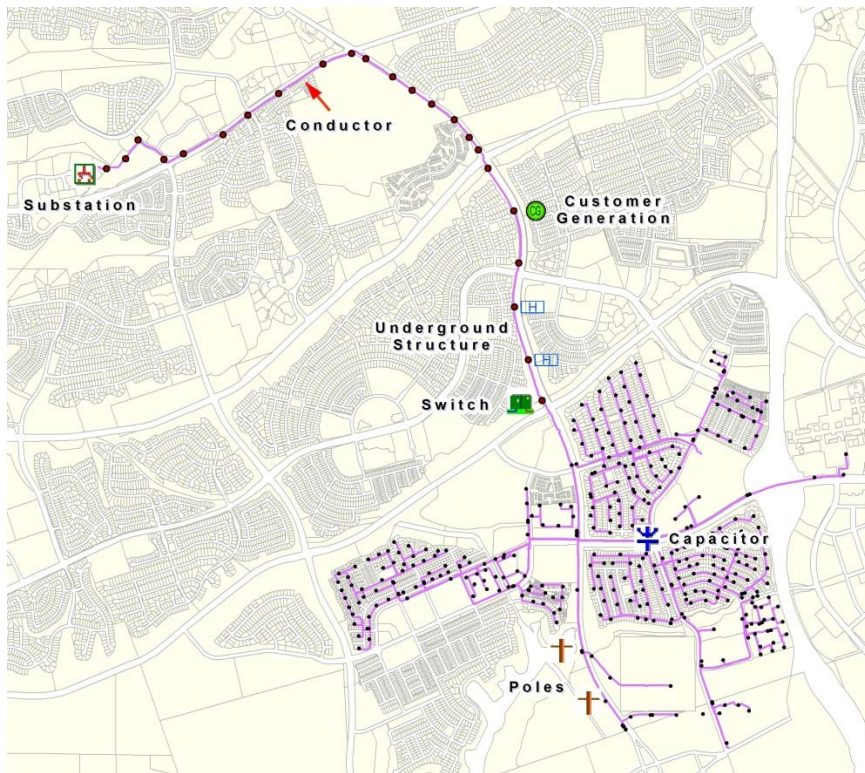
– Voltage limits

– Protection

– Reverse flow (Scenarios in Demo A)

Granularity of Analysis

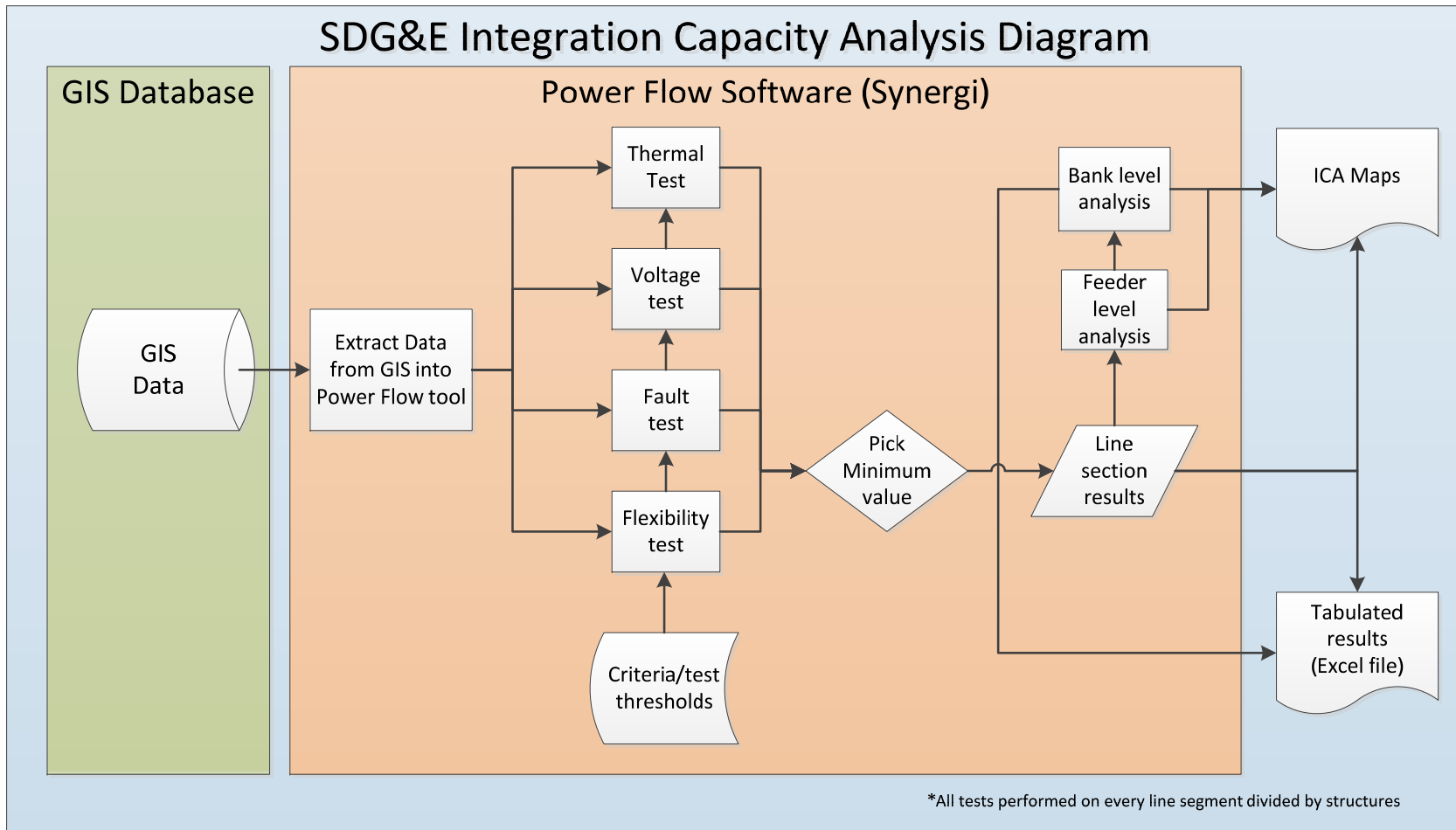
- Line Segments based on structures
- Demo A will include single phase analysis



Load Forecasting

- SDG&E load forecasts are changing for demo A
 - Modifying load due to coincident DER output
 - Move to 24 hour profiles
- SDG&E is leveraging existing SCADA data and LoadSeer tool to develop load forecast
 - Create 24/7 forecast demand curves
 - Enable DER profile analysis
 - Include growth scenarios

ICA Process



ICA Map Updates

- IOUs to modify maps to promote consistent user experience
- Adopting a uniform heat map appearance may help usability
- Provide downloadable data
 - DER profiles
 - Load profiles
 - ICA results
- **ICA WG input will be key to success of final product**

